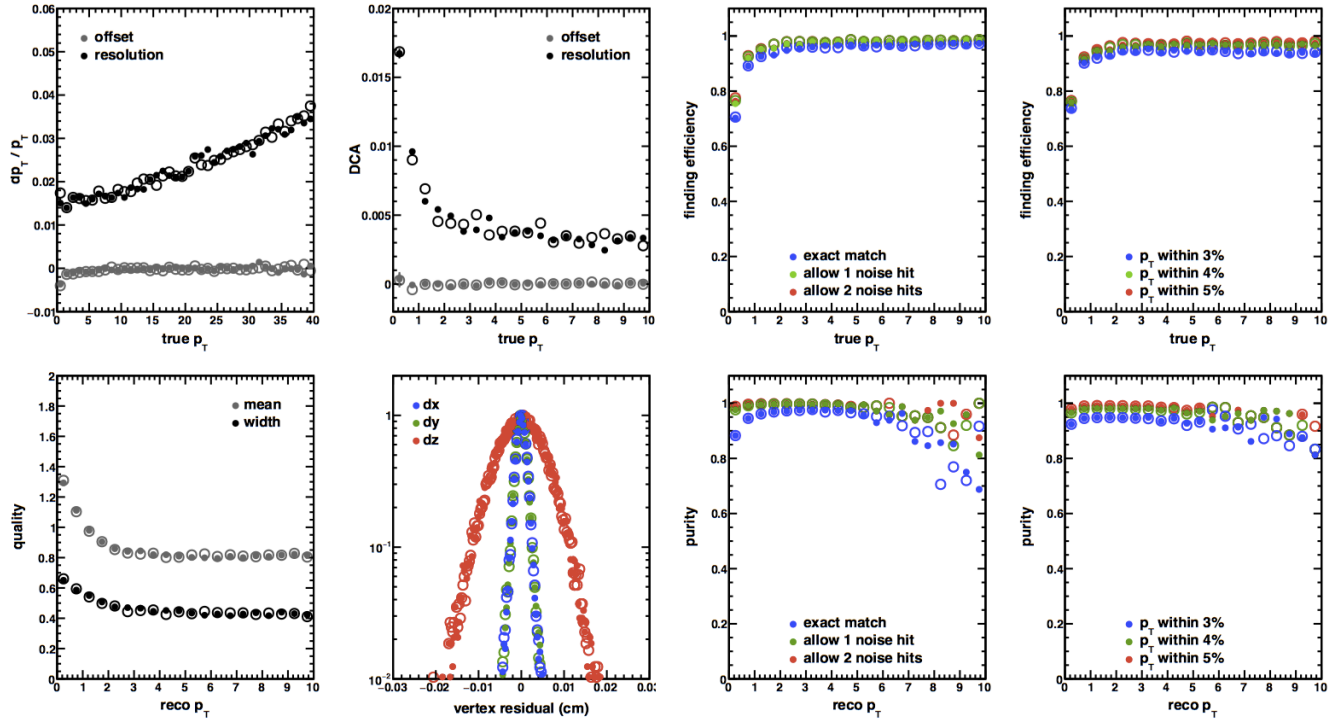
Standardized Calorimetry QA

Jin Huang (BNL)

Introduction

- As discussed in the last meeting, we need a standardized module to quickly check calorimetry performance, similar to that of tracking check from Mike
- Connected to plan on implementing QA history for ANA builds and new code submissions.
- Also ref to PHENIX QA webpage, though not updated for many years.... https://www.phenix.bnl.gov/viewvc/viewvc.cgi/phenix/utils/qa/pdst/interface/

Standardized tracking check from Mike: https://github.com/sPHENIX-Collaboration/coresoftware/pull/89

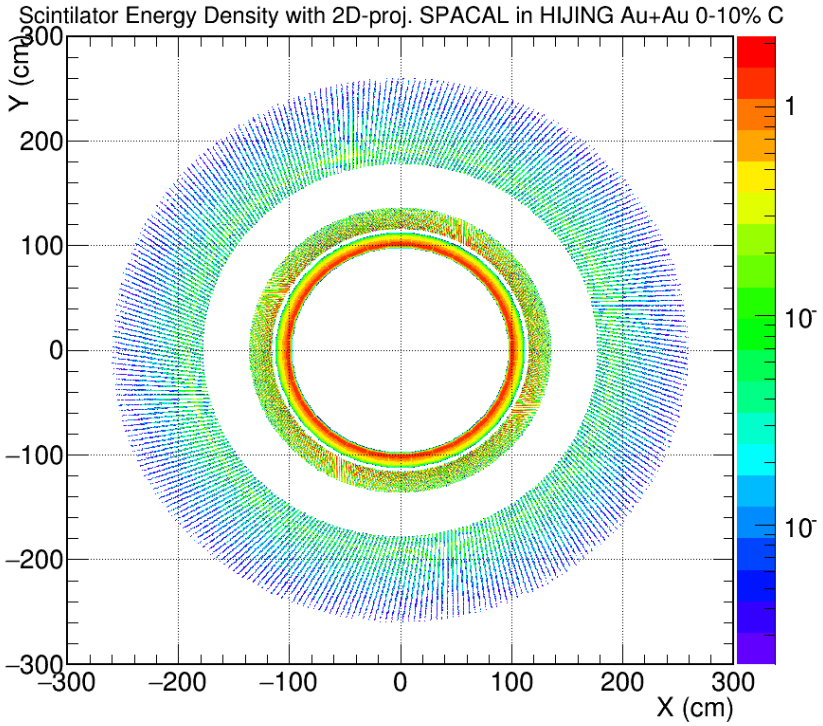


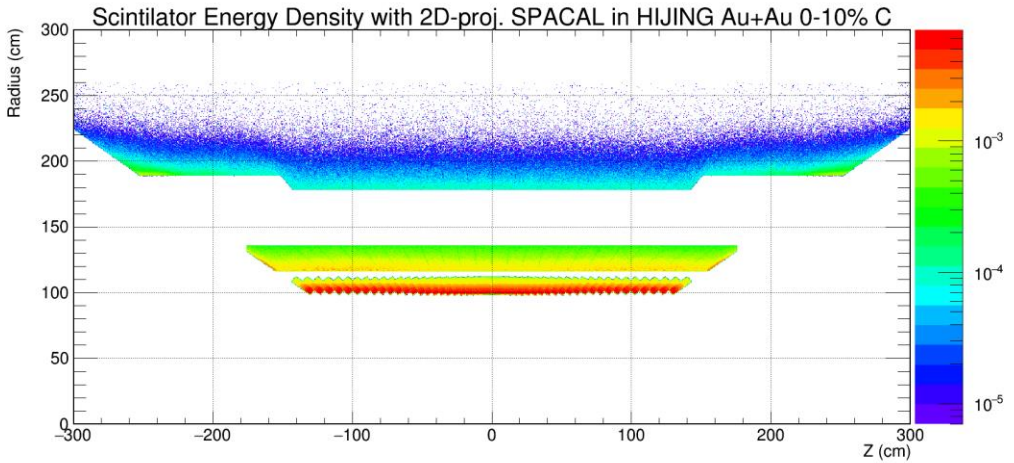
Prototype consideration

- Features in consideration:
  - Produce result on condor within hours, e.g. run after an ANA build
  - Produce few standard performance plot, e.g. resolution
  - A few low level plot to quickly check for problem without running simulation again (e.g. hit distribution, sample fraction, average energy deposition, etc.)
  - Produce database history of key performance number VS ANA builds (e.g. resolution for 30GeV pion VS build/time, sampling fraction VS build)
  - Webpage to visualize the result
- A development branch on going at https://github.com/blackcathj/coresoftware/tree/calo_qa/offline/QA/modules
  - A central place for QA modules: offline/QA/modules
  - Three module planed first:
    - **QAG4SimulationCalorimeter**: lower level check, one instance for each calorimeter
    - **QAG4SimulationCalorimeterSum**: summary shower performance sum all three calorimeters
    - **QAG4SimulationJet**: jet performance summary

Few plot planned for the QA modules
Over all distribution

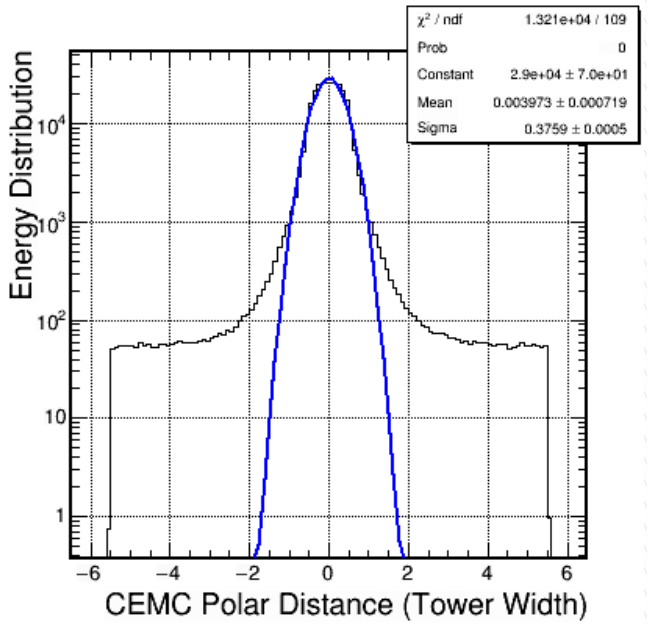
Data set planned: 1000 Pythia filtered jets in full detector

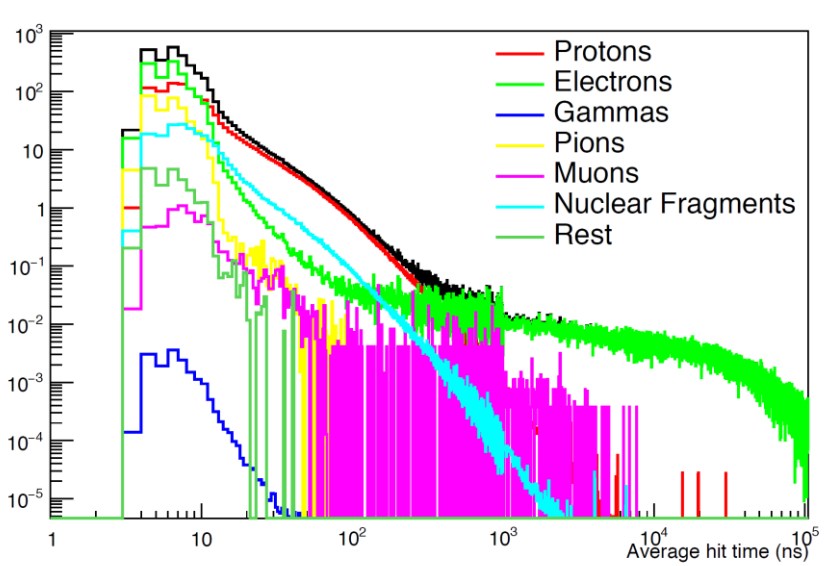




Few plot planned for the QA modules
Lateral and timing extent

Data set planned: 1000 8 GeV electron/30 GeV pion/Pythia filtered jets in full detector
Database record fraction within a cut.





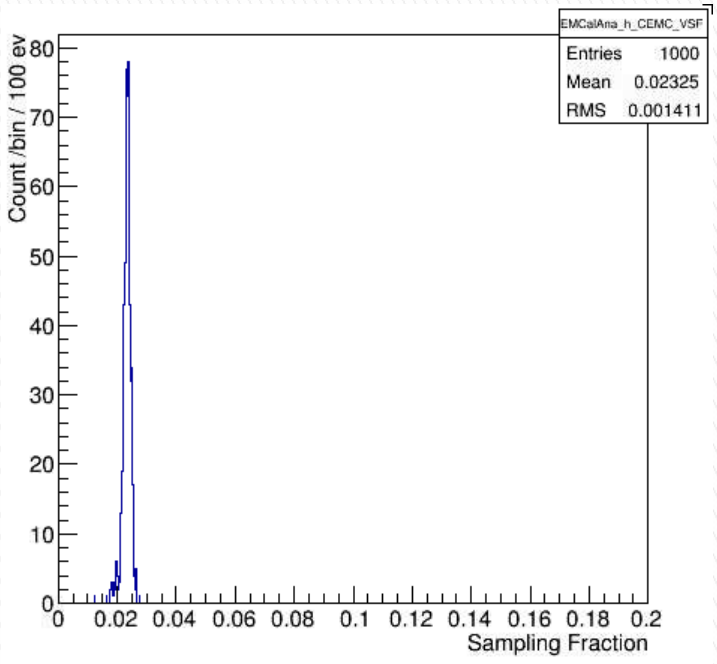
Tower distribution VS track projection

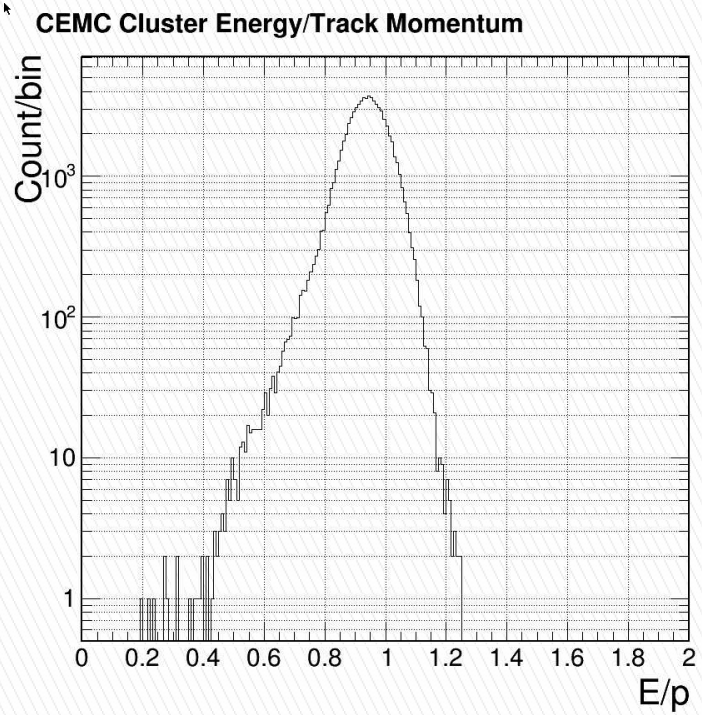
Timing distribution (Abhisek Sen)

Few plot planned for the QA modules Resolution and mean

Data set planned: 1000 8 GeV electron/30 GeV pion/Pythia filtered jets in full detector

Database record resolution and mean. Tails could require higher statistics to generate





Sampling fraction

Resolution